

REMARKS

Claims 1, 3-6 and 8-19 are pending. Claims 16-19 have previously been withdrawn from consideration. By this Amendment, claim 1 is amended to incorporate the subject matter of claims 2 and 7; and claims 2 and 7 are canceled. Reconsideration based on the above amendments and the following remarks is respectfully requested.

Entry of the amendments is proper under 37 C.F.R. §1.116 since the amendments:

(a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration since the amendments amplify issues previously discussed throughout prosecution; (c) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (d) place the application in better form for appeal, should an appeal be necessary. Entry of the amendments is thus respectfully requested.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Applicants thank Examiner Thomas for the courtesies extended to Applicants' representative during the September 27 personal interview. The substance of the personal interview is incorporated in the Remarks below.

**I. The Claims Define Allowable Subject Matter**

The Office Action rejects claims 1-4 under 35 U.S.C. §102(e) over U.S. Patent 6,205,014 to Inomata et al.; claims 1-4, 7-11 and 14-15 under 35 U.S.C. §102(b) over U.S. Patent 5,319,517 to Nomura et al.; claims 5 and 6 under 35 U.S.C. §103(a) over Inomata et al.; and claims 12 and 13 under 35 U.S.C. §103(a) over Inomata et al. in view of U.S. Patent 5,977,606 to Iguchi et al. These rejections are respectfully traversed.

The applied references do not teach, disclose or suggest a ratio between said average particle diameter (R) and the thickness (d) of said dielectric layer satisfying  $1 < R/d < 3$ , wherein the thickness (d) of said dielectric layer is less than 3  $\mu\text{m}$ , as now

recited in claim 1. The ratio signifies that the average particle diameter is greater than the thickness of said dielectric layer, and may be as much as three times larger. The applied references do not satisfy at least these recited features.

Instead, Inomata et al. discloses a multilayer ceramic capacitor comprising internal electrode layers and dielectric layers, wherein an average particle diameter ( $R$ ) of the dielectric layer particles, in a direction parallel with said internal electrode layers, is not larger than a thickness ( $d$ ) of the dielectric layer.

Referring to Fig. 2 of Inomata et al., some particle's diameters are as large as the thickness of the dielectric layer. However, most particle's diameters are smaller than the thickness of the dielectric layer. Accordingly, the average particle diameter ( $R$ ) of Inomata et al. is not larger than the thickness ( $d$ ) of the dielectric layer.

In col. 3, lines 15-23, Inomata et al. only discloses that the thickness of the dielectric layer is in the range of 5  $\mu\text{m}$  or thinner or thicker than 5  $\mu\text{m}$ , and the mean grain size is 3.5  $\mu\text{m}$  or larger. There is no disclosure or suggestion in Inomata's patent specification that the average particle diameter ( $R$ ) is larger than the thickness ( $d$ ) of the dielectric layer. In a common prior art, including Inomata's patent, the average particle diameter ( $R$ ) is not larger than the thickness ( $d$ ) of the dielectric layer.

In the present invention, being different from the common prior art, the average particle diameter ( $R$ ) is larger than the thickness ( $d$ ) of the dielectric layer. In the present invention, due to the dielectric layer having the above configuration, a highly reliable multilayer ceramic capacitor having large capacitance per a unit volume and a large capacitance even in a compact size can be realized. Also, the present invention, even if the thickness of the dielectric layer is less than 3  $\mu\text{m}$ , it is possible to obtain capacitance of a high volume ratio of 100 F/m<sup>3</sup> or more by obtaining the configuration wherein the largest particle diameter of particles is larger than a distance between the electrodes. These effects of the

present invention are confirmed by the examples and comparative examples as shown in Table 1 of the present specification.

Likewise, Nomura et al. only discloses a multilayer ceramic capacitor comprising internal electrode layers and dielectric layers, wherein a average particle diameter ( $R$ ) of the dielectric layer particles, in a direction parallel with said internal electrode layers, is not larger than a thickness ( $d$ ) of the dielectric layer.

In col. 1, lines 60-65 and col 5, lines 62-64, Nomura et al. only discloses that the thickness of the dielectric layer is 10  $\mu\text{m}$  or less, and the mean grain size is 1 to 5  $\mu\text{m}$ . There is no disclosure or suggestion in Nomura's patent specification that the average particle diameter ( $R$ ) is larger than the thickness ( $d$ ) of the dielectric layer. In a common prior art, including Nomura et al., the average particle diameter ( $R$ ) is not larger than the thickness ( $d$ ) of the dielectric layer.

In the claimed invention, being different from the common prior art, the average particle diameter ( $R$ ) is larger than the thickness ( $d$ ) of the dielectric layer.

Iguchi et al. does not make up for these deficiencies. Instead, Iguchi et al. only discloses core-shell structure dielectric particles for dielectric layers in multilayer ceramic capacitors. Iguchi et al. does not disclose or suggest that the average particle diameter ( $R$ ) is larger than the thickness ( $d$ ) of the dielectric layer.

For at least these reasons, Inomata et al. fails to anticipate the subject matter of claims 1-4 under 35 U.S.C. §102(e); Nomura et al. fails to anticipate the subject matter of claims 1-4, 7-11, 14 and 15 under 35 U.S.C. §102(b); Inomata et al. fails to render obvious the subject matter of claims 5 and 6 under 35 U.S.C. §103(a); and the combination of Inomata et al. and Iguchi et al. fails to render obvious the subject matter of claims 12 and 13 under 35 U.S.C. §103(a). Withdrawal of the rejections of claims 1-4 under 35 U.S.C. §102(e) over Inomata et al.; claims 1-4, 7-11, 14 and 15 under 35 U.S.C. §102(b) over Nomura et al.;

claims 5 and 6 under 35 U.S.C. §103(a) over Inomata et al.; and claims 12 and 13 under 35 U.S.C. §103(a) over Inomata et al. in view of Iguchi et al. is respectfully requested.

**II. Conclusion**

For at least these reasons, it is respectfully submitted that this application is in condition for allowance. Reconsideration of the application is requested.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

  
James A. Oliff  
Registration No. 27,075

Richard J. Kim  
Registration No. 48,360

JAO:RJK/sld

Attachment:  
Appendix

Date: December 2, 2002

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

DEPOSIT ACCOUNT USE  
AUTHORIZATION  
Please grant any extension  
necessary for entry;  
Charge any fee due to our  
Deposit Account No. 15-0461

## APPENDIX

## Changes to Claims:

Claims 2 and 7 are canceled.

The following is a marked-up version of the amended claim 1:

1. (Twice Amended) A multilayer ceramic capacitor comprising:

internal electrode layers; and

dielectric layers, wherein the dielectric layers comprise comprising particles,  
wherein an average particle diameter ( $R$ ), in a direction parallel with said internal electrode  
layers, is larger than a thickness ( $d$ ) of said dielectric layer, wherein a ratio ( $R/d$ ) between  
said average particle diameter ( $R$ ) and the thickness ( $d$ ) of said dielectric layer satisfies  
 $1 < R/d < 3$ , and wherein the thickness ( $d$ ) of said dielectric layer is less than 3  $\mu\text{m}$ .